

# The American Midland Naturalist

PUBLISHED BI-MONTHLY BY THE UNIVERSITY  
OF NOTRE DAME, NOTRE DAME, INDIANA

VOL. IX.

MARCH, 1924.

NO. 2

## The Birds of Floyd County, Iowa.

CARROLL LANE FENTON.

### IV.—SPECIAL TABLES AND DISCUSSIONS; BIBLIOGRAPHY, PLATES.

#### TABLE I.

#### SPRING MIGRATION RECORD OF THE AUTHOR, 1917.

(Jan. 1 to June 13)

Name of Bird	When First Seen	How Many Seen	When Next Seen	When it Became Common	When Last Seen
Pied-billed Grebe .....	Apr. 19	1	May 2	May 25	
Black Tern .....	May 23	1	May 24		May 25
Forster's Tern .....	May 1	8	May 2		May 2
Canada Goose .....	Mar. 26	6			Mar. 26
Bittern .....	May 15	1	May 30	May 30	
Least Bittern .....	May 24	1	May 30	May 30	
Great Blue Heron .....	May 28	1			
Little Green Heron .....	Apr. 19	1	May 15	May 15	
Black-crowned Night Heron .....	May 1	1	June 12	June 12	
Virginia Rail .....	May 24	1			May 24
Sora .....	Apr. 19	1	May 15	May 24	
Florida Gallinule .....	May 6	1	May 24	May 24	May 27
Coot .....	Apr. 15	1	May 24	May 24	
Woodcock .....	May 28	1			May 28
Wilson's Snipe .....	Apr. 2	1	Apr. 15	Apr. 29	May 6
Little Blue Heron (?) .....	June 12	1			
Yellowlegs .....	June 12	1	June 14	June 12 (?)	
Greater Yellowlegs .....	June 12	3	June 14	June 12	
Upland Plover .....	June 12	4	June 13	June 12	
Spotted Sandpiper .....	Apr. 15	2	May 15	May 15	
Killdeer .....	Mar. 21	1	Mar. 22	Mar. 22	
Mourning Dove .....	Apr. 2	2	Apr. 11	Apr. 12	
Marsh Hawk .....	Apr. 12	2	June 18	June 21	
Sharp-shinned Hawk .....	Apr. 19	1	Apr. 24		
Cooper's Hawk .....	Apr. 11	1	Apr. 19		
Red-tailed Hawk .....	Mar. 18	2	Mar. 25	Mar. 25	
Red-shouldered Hawk .....	Mar. 14	3	Mar. 18	Mar. 18	
Broad-winged Hawk .....	Mar. 22	1	Apr. 3	Apr. 11	
Pigeon Hawk .....	Apr. 12	1			

Name of Bird	About		When Next Seen	When it Became Common	When Last Seen
	When First Seen	How Many Seen			
Sparrow Hawk	May 27	2	June 2		
Barred Owl	Feb. 3	2	Feb. 16		
Screech Owl	Jan. 7	1	Jan. 8		
Black-billed Cuckoo	June 10	2	June 11	June 12	
Yellow-billed Cuckoo	June 10	1	June 11	June 12	
Belted Kingfisher	Mar. 25	1	Apr. 2	Apr. 2	
Hairy Woodpecker	Jan. 2	4	Jan. 6	Jan. 2	June 8
Northern Hairy Woodpecker (?)	Feb. 9		Mar. 2	Mar. 2	May 27
Downy Woodpecker	Jan. 3	2	Jan. 5	Jan. 3	May 24
Yellow-bellied Sapsucker	Apr. 5	1	Apr. 12	Apr. 5	
Red-headed Woodpecker	Jan. 2	4	Mar. 2	Mar. 2	
Northern Flicker	Mar. 25	1	Apr. 2	Apr. 12	
Whip-poor-will	June 20	1			
Nighthawk	May 15	1	May 16	May 31	
Chimney Swift	May 4	4	May 5	May 20	
Ruby-throated Hummingbird	May 22	1	June 8		
Kingbird	May 20	1	May 24	May 31	
Phoebe	Apr. 5	4	Apr. 9	Apr. 9	
Wood Pewee	May 6	3	May 9	May 6	
Acadian Flycatcher (?)	May 24		May 25	May 24	May 27
Prairie Horned Lark	Apr. 2	3	May 6	Apr. 2	
Hoyt's Horned Lark (?)	May 6	2	June 8	June 8	
Blue Jay	Jan. 3	2	Jan. 1	Jan. 3	
Crow	Jan. 2	5	Jan. 10	Jan. 2	
Bobolink	Apr. 29	1	May 7	June 8	
Cowbird	Mar. 25	1	Apr. 18	Apr. 19	
Yellow-headed Blackbird	June 10	3			June 10
Red-winged Blackbird	Mar. 22	10	Mar. 24	Mar. 24	
Meadowlark	Mar. 20	1	Mar. 21	Mar. 30	
Western Meadowlark	Mar. 26	1	Mar. 27	Mar. 27	
Orchard Oriole	May 16	1	May 22	May 22	
Baltimore Oriole	May 12	2	May 13	May 13	
Rusty Blackbird	Apr. 15	4	May 1	May 1	
Brewer's Blackbird	Apr. 12	6	May 1	Apr. 12	
American Goldfinch	May 13	3	May 14	May 13	
Snow Bunting	Mar. 21	1			Mar. 21
Vesper Sparrow	Apr. 12	23	Apr. 13	Apr. 13	
English Sparrow	Jan. 1	8	Jan. 2	Jan. 1	
Savannah Sparrow	Apr. 12	3	Apr. 15	Apr. 15	
Grasshopper Sparrow	Apr. 5	4	Apr. 6	Apr. 5	
Harris' Sparrow	Apr. 15	2	Apr. 16	Apr. 16	
White-crowned Sparrow	Apr. 12	12	Apr. 15	Apr. 12	May 25
White-throated Sparrow	Apr. 15	14	May 1	May 1	
Tree Sparrow	Jan. 6	6	Jan. 14	Jan. 6	
Field Sparrow	Apr. 19		Mar. 24	May 24	
Slate-colored Junco	Feb. 22	2	Mar. 10	Mar. 10	May 13
Chipping Sparrow	Apr. 2	18	Apr. 5	Apr. 2	
Song Sparrow	Apr. 2	40	Apr. 4	Apr. 2	
Swamp Sparrow	Apr. 2	6	Apr. 12	Apr. 19	May 27
Fox Sparrow	Apr. 12	6	May 27	Apr. 12	May 27
Cardinal	May 27	1			May 27
Rose-breasted Grosbeak	Apr. 15	1	May 15	May 16	

Indigo Bunt  
Dickcissel  
Scarlet Tanager  
Purple Martin  
Cliff Swallow  
Barn Swallow  
Tree Swallow  
Rough-winged  
Bohemian Warbler  
Henslow's Sparrow  
Migrant Sparrow  
Red-eyed Vireo  
Warbling Vireo  
White-eyed Vireo  
Black and White  
Prothonotary  
Tennessee Warbler  
Yellow Warbler  
Myrtle Warbler  
Magnolia Warbler  
Blackburnian Warbler  
Black-throated  
Ovenbird  
Louisiana Warbler  
Grinnell's Warbler  
Connecticut Warbler  
Mourning Warbler  
Maryland Yellow  
Canadian Warbler  
American Goldfinch  
Catbird  
Brown Thrasher  
Bewick's Wren  
House Wren  
Carolina Wren  
Short-billed  
Brown Creeper  
Chickadee  
Long-tailed  
Golden-crowed  
Ruby-crowned  
Wood Thrush  
Veery  
Olive-backed  
Hermit Thrush  
Robin  
Bluebird

# BIRDS OF FLOYD COUNTY, IOWA.

67

Name of Bird	About		When Next Seen	When it Became Common	When Last Seen
	When First Seen	How Many Seen			
Indigo Bunting	June 21	1			
Dickcissel	Mar. 25	3	Apr. 2	Apr. 2	
Scarlet Tanager	May 25	1	May 27	May 27	
Purple Martin	Apr. 24	7	Apr. 26	Apr. 24	
Cliff Swallow	May 24	12	May 27	May 24	
Barn Swallow	Apr. 26	23	Apr. 29	Apr. 26	
Tree Swallow	Apr. 26	37	Apr. 29	Apr. 26	
Rough-winged Swallow	Apr. 26	8	May 1	May 1	
Bohemian Waxwing	June 8	4			
Henslow's Sparrow	Apr. 2	6	Apr. 6	Apr. 2	Apr. 6
Migrant Shrike	June 12	7	June 18	June 12	
Red-eyed Vireo	May 6	1	May 20	May 20	
Warbling Vireo	May 6	1	May 27	May 27	
White-eyed Vireo	May 15	2	May 20	May 24	
Black and White Warbler	May 24	2	May 26	May 26	
Prothonotary Warbler	May 15	2	May 16	May 16	
Tennessee Warbler	May 6	1			May 6
Yellow Warbler	May 15	1	May 16	May 16	
Myrtle Warbler	Apr. 16	3	Apr. 22	Apr. 24	May—
Magnolia Warbler	Apr. 16	4	Apr. 28	May 1	
Blackburnian Warbler	May 22	7	May 27	May 22	May 27
Black-throated Green Warbler	May 6	1			May 6
Ovenbird	May 15	1	May 16	May 24	
Louisiana Waterthrush	May 15	28	May 16	May 15	
Grinnell's Water-thrush	May 24	6	May 26	May 24	
Connecticut Warbler	May 20	1	May 24	May 24	
Mourning Warbler	May 25	1			May 25
Maryland Yellowthroat	May 15	3	May 16	May 20	
Canadian Warbler	May 22	18	May 23	May 22	June 8
American Redstart	May 15	2	May 25	May 25	
Catbird	Mar. 25	1	May 15	May 15	
Brown Thrasher	Apr. 26	1	May 1	May 15	
Bewick's Wren	May 15	1			May 15
House Wren (Western)	May 7	2	May 10	May 10	
Carolina Wren	Apr. 19	1			Apr. 19
Short-billed Marsh Wren	May 20	2	June 12		
Brown Creeper	Jan. 5	1	Feb. 13	Jan. 5	
Chickadee	Jan. 2	4	Jan 2	Jan. 3	
Long-tailed Chickadee	Jan. 2	2			Jan 2
Golden-crowned Kinglet	Apr. 5	4	Apr. 10	Apr. 5	May 10
Ruby-Crowned Kinglet	Apr. 2	13	Apr. 5	Apr. 5	May 11
Wood Thrush	Mar. 30	1	May 2	May 2	
Veery	Apr. 12	2	Apr. 23	May 16	
Olive-backed Thrush	Apr. 12	1			Apr. 12
Hermit Trush	Apr. 2	6	Apr. 12	Apr. 12	Apr. 24
Robin	Mar. 14	1	Mar. 16	Mar. 16	
Bluebird	Mar. 13		Mar. 14	Mar. 14	

TABLE 2.  
WINTER BIRDS OF FLOYD COUNTY.

## A—RESIDENTS.

SPECIES	Nov.	Dec.	Jan.	Feb.
Bobwhite	x	x	x	x
Ruffed Grouse	x	x	x	x
Prairie Chicken	x	x	x	x
Wild Turkey	?	x	x	x
Bald Eagle *	x	x	?	
Long-eared Owl	x	?	x	x
Short-eared Owl	x	x	x	x
Barred Owl	x	x	x	x
Screech Owl	x	x	x	x
Great Horned Owl	x	x	x	x
Hairy Woodpecker	x	x	x	x
No. Downy Woodpecker	x	x	x	x
Redheaded Woodpecker	x	x	x	x
Blue Jay	x	x	x	x
Crow	x	x	x	x
Goldfinch	x	x	x	x
Cardinal		x	x	
Northern Shrike	x	x	x	x
Brown Creeper	x	x	x	x
White-breasted Nuthatch	x	x	x	x
Chickadee	x	x	x	x

\* Probably now a winter resident.

## B—WINTER RESIDENTS.

SPECIES	Nov.	Dec.	Jan.	Feb.
Goshawk *	x	x	?	
Golden Eagle	x	x	x	
Snowy Owl	x	x	x	x
Tree Sparrow	x	x	x	x
Slate-colored Junco	x	x	x	x
Red-breasted Nuthatch	x	x	x	x

\* Perhaps a late migrant.

Saww  
Pine  
Cross  
Redpo  
Pine

Yellow  
Cedar  
Blueb  
Golden

E—SUM

Belte  
Phoeb  
Weste  
Robin

Of th  
of the  
the Me  
occur i  
Iowa B

\* Data  
Birds of



## C—WINTER VISITANTS.

SPECIES	Nov.	Dec.	Jan.	Feb.
Sawwhet Owl -----	x		x	
Pine Grosbeak -----	?	x	x	x
Crossbill -----		x	x	x
Redpoll -----	x	x		
Pine Siskin -----	x	x	?	

## D—MIGRANTS.

SPECIES	Nov.	Dec.	Jan.	Feb.
Yellow-bellied Sapsucker -----	x			x
Cedar Waxwing -----	x	?		
Bluebird -----	x			x
Golden-crowned Kinglet -----	x			x

## E—SUMMER RESIDENTS, OCCASIONALLY REMAINING IN WINTER.

SPECIES	Nov.	Dec.	Jan.	Feb.
Belted Kingfisher -----	x	x		?
Phoebe -----	x	x	?	
Western Meadowlark -----	x	x		x
Robin -----	x	x	x	x

## THE RAPTORES.

Of the 100 species of Raptores given in the 1910 Checklist of the American Ornithologists' Union as occurring north of the Mexican boundary in North America and Greenland, 309 occur in Iowa.\* To this list one subspecies is to be added, the Iowa Broadwinged Hawk of Bailey (Rapt, Bds. Ia., 1918, 130),

\* Data on Raptores of the state taken from Bailey's "The Raptorial Birds of Iowa," Bull. 6, 1918, Iowa Geological Survey.

making a total of 101 for North America and 40 for the state of Iowa. The species and subspecies are distributed as follows:

	IOWA	FLOYD COUNTY	N. A.
Vultures -----	3	1	3
Hawks -----	27	16 (17?)	54
Owls -----	12	8	44
	40	25 (26?)	101
Percent for state -----	62.5		
Percent for N. A. -----	24.75		

• This relatively large percentage is probably largely due to the great changes of temperature, which allows for both northern and southern forms. It is also to be noted that in the 4th. Provisional Map of the Biological Survey, 1910, Merriam puts some two-thirds of Cerro Gordo, most of Mitchell, and the northwestern part of Floyd counties in the Transition zone. The balance of Cerro Gordo and Floyd counties, and all of Chickasaw County, are in the Upper Austral zone. This condition probably aids in the relatively large representation of the raptorial avifauna.

In the following table the raptorial birds of Floyd County are listed. From left to right, the list is divided in accordance with the habitat of the birds; from top to bottom in accordance with their region of greatest abundance.

#### SYMBOLS.

* Nesting.	** Permanent resident.
§ Occurring in winter; usually a winter resident.	
‡ Occasional in winter.	† Migrant.
c Common.	tc Tolerably common.
u Uncommon.	r Rare.
rr Very rare.	

NOTE:—Above symbols refer to Table 3 on following page.

A

B

C

D

E

A.—A  
B.—A  
C.—A  
D.—A  
abundant  
E.—A

TABLE III.  
RAPTORIAL BIRDS OF FLOYD COUNTY.

	Species preferring Timbered Regions.	Species frequenting both Timber and Prairie	Species preferring Prairie Regions.
A	††Goshawk (r)		§Snowy Owl (r) Hawk (u) §Rough-legged
B	*Red-shouldered Hawk (tc) *Broad-winged Hawk Bald Eagle **Barred Owl (c) **Great Horned Owl (u)	*Sparrow Hawk(c) *†Red-tailed Hawk (tc)	
C	Swallow-tailed Kite (rr) *Sharp-shinned Hawk (c) *Cooper's Hawk(c) *Barn Owl (r)	†*Turkey Vulture (r)	
D	Duck Hawk (?) *Long-eared Owl (u) †Sawwhet Owl **Screech Owl (c)	†Pigeon Hawk (u) †Osprey (r)	*Marsh Hawk (c) *Short-eared Owl. (c)
E		*Krider's Hawk (tc) Swainson's Hawk (u) §Golden Eagle (u)	
	Total 13 (&1?)	Total 8	Total 4

A.—Area of greatest abundance Northward, coming south in winter.

B.—Area of greatest abundance Eastward, extending westward.

C.—Area of greatest abundance Southward, coming north in summer.

D.—Area of greatest abundance Iowa or contiguous states, or as abundant there as elsewhere.

E.—Area of greatest abundance Westward, extending eastward.

## LOCAL NAMES OF BIRDS, IN USE IN OR NEAR FLOYD COUNTY.

In my study of the birds of the county I have given some attention to the common or local names by which they are known. With a few exceptions the names do not seem to be restricted to this district; most of them are the common names by which the birds are known throughout the middle west.

Most of the birds are without popular names of any sort. The Indigo Bunting, for example, is known by name—any name—to a very small percentage of the people. All gulls, if recognized at all, are merely "gulls," all sparrows are "sparrows." Such lump classifications are not considered here.

## COLYMBIDAE.

*Podilymbus podiceps* (Linn.). Diving Duck, Hell Duck, Hell Diver, Little Diver, Little Grebe.

## GAVIIDAE.

*Gavia immer* (Brunn.). Hell Diver, Great Diver, Northern Diver, Black-and-white Diver, Big Diver.

## PELECANIDAE.

*Pelecanus erythrorhynchos* Gmel.. Pelican, Yellow-billed Pelican.

## ANATIDAE.

*Mergus americanus* (Cass.). Fish Duck.

*Lophodytes cucullatus* (Linn.). Fish Duck, Sheldrake.

*Spatula clypeata* (Linn.). Sheldrake.

*Charitonetta albeola* (Linn.). Butterball.

*Chen caerulescens* (Linn.). Black Goose (applied to young).

## ARDEIDAE.

*Botaurus lentiginosus* (Mont.). Mud-pump, Mud-pumper, Sheitpoke.

*Ixobrychus exilis* (Gmel.). Sheitpoke, Snipe, Fly-up-the-creek.

*Ardea herodias herodias* Linn. Blue Crane, Sandhill Crane, Sheitpoke.

*Butorides virescens virescens* (Linn.). Sheitpoke, Mud Chicken.

*Nycticora nycticora naevius* (Bodd.). Blue Crane, Blue Heron, Sheitpoke (young).

## RALLIDAE.

*Rallus elegans* Aud. Sheitpoke, Mud Chicken, Mudhen.

*Rallus virginianus* Linn. Sheitpoke, Mud Chicken, Mudhen.

*Porzana carolina* (Linn.). Sheitpoke, Little Sheitpoke Crake.

*Gallinula galeata galeata* (Light.). Coot, Mudhen, Waterhen.

*Fulica americana* Gmel. Mudhen, Waterhen, Swamp Hen, Black Mudhen.

## SCOLOPACIDAE.

*Gallinago delicata* (Ord.). Snipe, Jacksnipe, English Snipe, Little Sheitpoke.

*Totanus melanoleucus* (Gmel.). Sheitpoke, Snipe, Stilt, Yellowshank.

*Totanus flavipes* (Gmel.). Sheitpoke, Little Sheitpoke, Snipe.

## CHARACRIIDAE.

*Oxyechus vociferus vociferus* (Linn.). Plover, Kildee.

## TETRAONIDAE.

*Colinus virginianus virginianus* (Linn.). Quail, Partridge.

*Bonasa umbellus umbellus* (Linn.). Partridge, Woodhen, Woodcock.

*Tympanuchus americanus americanus* (Reich.). Prairie Hen.

## COLUMBIDAE.

*Ectopistes migratorius* (Linn.). Wild Pigeon, Pigeon.

*Zenaidura macroura carolinensis* (Linn.). Turtle Dove, Pigeon.

## CATHARTIDAE.

*Cathartes aura septentrionalis* (Wied.). Buzzard, Turkey Buzzard, Black Buzzard.

## BUTEONIDAE.

*Circus hudsonicus* (Linn.). Chicken Hawk, Hen Hawk, Blue Hawk.

*Accipiter velox* (Wils.). Chicken Hawk, Hen Hawk, Pigeon Hawk.

*Accipiter cooperi* (Bonap.). Chicken Hawk, Hen Hawk.

*Buteo borealis borealis* (Gmel.). Chicken Hawk, Hen Hawk.

*Aquila chrysaetos* (Linn.). Chicken Hawk, Hen Hawk, Eagle Black Eagle.

#### STRIGIDAE.

*Asio wilsonianus* (Less.). Screech Owl, Hoot Owl, Cat Owl.

*Asio flammeus* (Pont.). Screech Owl, Ground Owl, Swamp Owl.

*Strix varia varia* Barton. Hoot Owl.

*Otus asio asio* (Linn.). Hoot Owl, Little Owl (rare).

*Bubo virginianus virginianus* (Gmel.). Hoot Owl, Cat Owl.

*Nyctea nyctea* (Linn.). White Owl, Hoot Owl, Northern Owl.

#### CUCULIDAE.

*Coccyzus erythrophthalmus* (Wils.). Rain Crow, Squouk (pron. 'skwouk').

*Coccyzus americanus americanus* (Linn.). Rain Crow Squouk.

#### PICIDAE.

*Dryobates villosus villosus* (Linn.). Sapsucker, Big Sapsucker, Spotted Woodpecker.

*Dryobates pubescens medianus* (Swains.) Sapsucker, Spotted Woodpecker.

*Colaptes auratus lutens* (Bangs.). Yellowhammer, Yellow-winged Woodpecker, Golden-winged Woodpecker, High-hole, High-holder, Whickaree, Ant Woodpecker.

#### TYRANNIDAE.

*Tyrannus tyrannus* (Linn.). Bee Martin, Bee Bird.

#### CORVIDAE.

*Cyanocitta cristata cristata* (Linn.). Jay, Jay-bird.

#### ICTERIDAE.

*Molothrus ater ater* (Bodd.). Cow Blackbird, Blackbird.

*Quiscalus quiscula aeneus* Ridgway. Blackbird, Crow, Blackbird, Crowbird.

FRING

Astr

Spiz

Junc

Plect

TANA

Pira

LANII

Lani

Bi

MIMII

Toxo

TI

TROG

Trog

SITTI

Sitt

D

Sitt

he

TURD

Hyl

Hyl

Anders

Bailey,

Califor

Fenton

## FRINGILLIDAE.

*Astragalinus tristis tristis* (Linn.). Canary, Wild Canary.

*Spizella passerina passerina* (Bech.) Chippy.

*Junco hyemalis hyemalis* (Linn.). Snowbird.

*Plectrophenax nivalis* (Linn.). Snowbird.

## TANAGRIDAE.

*Piranga erythromelas* Vieill. Tanager, Redbird.

## LANIIDAE.

*Lanius ludovicianus migrans* Palmer. Butcher Bird, Killer Bird.

## MIMIDAE.

*Toxostoma rufum* (Linn.). Brown Thrush, Spotted Thrush, Thrasher-bird.

## TROGLODYTIDAE.

*Troglodytes aëdon parkmani* (Aud.). Jenny Wren.

## SITTIDAE.

*Sitta carolinensis carolinensis* Lath. Creeper, Sapsucker, Devil Downhead.

*Sitta canadensis* Linn. Creeper, Sapsucker, Devil Downhead.

## TURDIDAE.

*Hylocichla mustelina* (Gmel.). Bell Bird.

*Hylocichla guttata pallasi* (Cab.). Bell Bird, Brown Thrush.

## BIBLIOGRAPHY.

- Anderson, Rudolph Martin. The Birds of Iowa. Proc. Davenport Acad. Sci., XI, pp. 125-417, Davenport, 1907.
- Bailey, Bert Heald. (Clementina Spencer, ed.) The Raptorial Birds of Iowa. Ia. Geol. Surv., Bull. 6, Des Moines, 1918.
- Two Hundred Wild Birds of Iowa, Cedar Rapids, 1906.
- Califor Naturalist Club. First, second, and third annual reports: bird lists by members. Charles City, 1916, 1917, 1918.
- Bulletin, vol. I, no. 1. Charles City, May, 1916.
- Fenton, Carroll Lane. Nesting of the Mountain Bluebird at Charles City, Bull. C. N. C., vol: I. no. 1.
- Preliminary List of the Birds of Floyd County, Iowa, (incomplete), Wilson Bulletin, no. 96, pp. 130-138, Oberlin, 1916.



- Gabrielson, Ira N. A Criticism of Two Recent Lists of Iowa Birds. Wilson Bulletin, No. 99, pp. 97-100, Oberlin, 1917.
- Keyes, Charles Rollin, and Williams, H. S. Preliminary Annotated Catalogue of the Birds of Iowa. Proc. Davenport Acad. Nat. Sci., V, pp. 113-161, Davenport, 1888.
- Krider, John. Forty Years' Notes of a Field Ornithologist, 1879.
- Page, Mrs. A. G. From a Kitchen Window; Beyond the Window, The Prairie, I, pp. 10-11. Charles City, Jan. 1921.
- Webster, Clement L. History of Floyd County, Charles City, 1896.
- Albinism in Iowa, Iowa Naturalist, II, p. 38, Iowa City, 1909.
- The Whip-poor-will in Floyd County, Bull. C. N. C., I, Charles City, 1916.

## CORRECTION.

In the second instalment of this paper (Am. Mid. Nat., vol. VIII, Nos. 10-11) there are two typographical errors. Thus on page 236( for the line "16 *Sturnella neglecta* Aud. Western Meadow Lark" read "125, *Sturnella magna magna* (Linn.). Meadow Lark." Page 251, for "208. *Dumetella carolinensis*" read "209. *Dumetella carolinensis*."

## KEY TO SPECIES.

- |                           |                          |
|---------------------------|--------------------------|
| 67—Kildeer.               | 126—Western Meadow Lark. |
| 90—Sparrow Hawk.          | 128—Baltimore Oriole.    |
| 106—Redheaded Woodpecker. | 136—Goldfinch.           |
| 108—Northern Flicker.     | 151—Chipping Sparrow     |
| 111—Chimney Swift.        | 162—Dickcissel.          |
| 113—Kingbird.             | 163—Scarlet Tanager.     |
| 115—Phoebe.               | 168—Bank Swallow.        |
| 116—Wood Pewee.           | 187—Yellow Warbler.      |
| 118—Blue Jay.             | 209—Catbird.             |
| 120—Crow.                 | 210—Brown Thrasher.      |
| 124—Red-winged Blackbird. | 227—Robin.               |
| 125—Meadow Lark.          |                          |



Sk  
and  
Open  
Plate

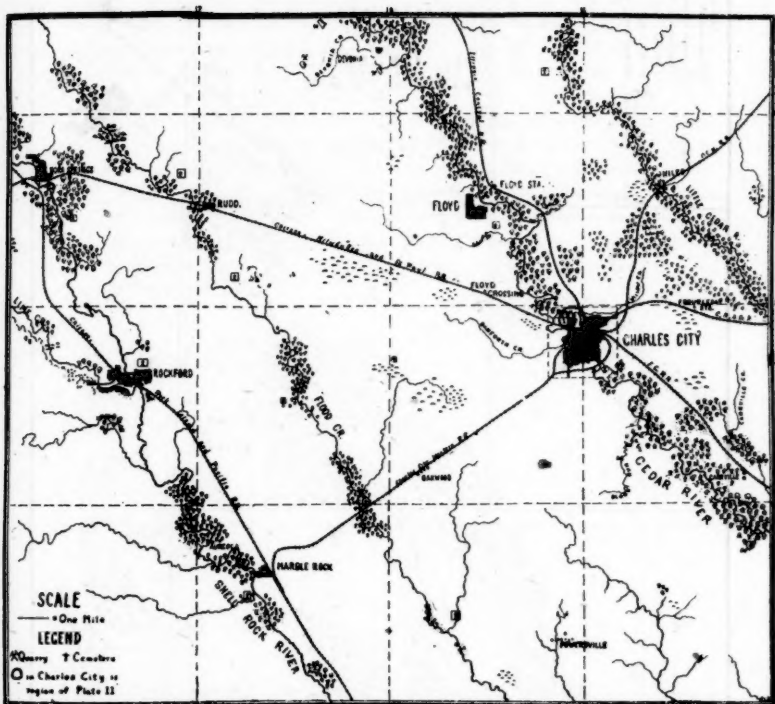
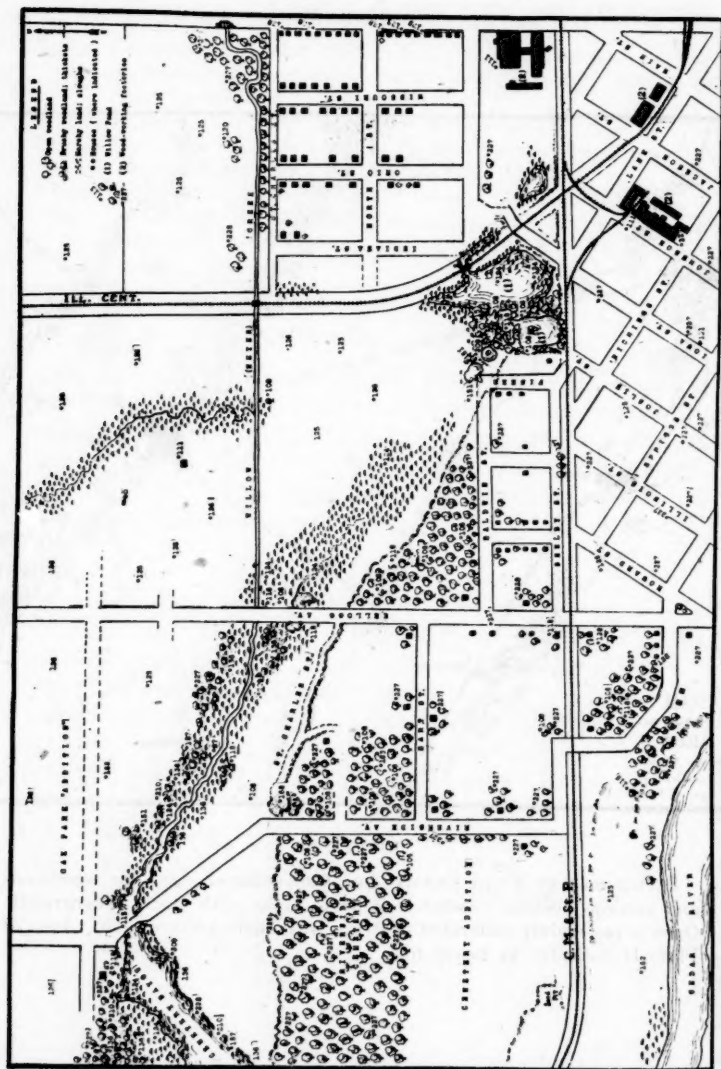


PLATE I.

Sketch map of Floyd County, Ia. Conventional signs for woodlands and swamps; dotted woodlands indicate areas with much undergrowth. Open areas mainly cultivated prairies, with some pasture land. Area of Plate II indicated by heavy line.



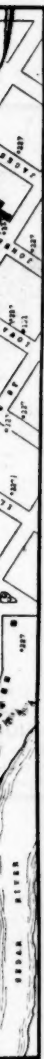
Map  
nesting  
hand co  
of Kello  
undesir  
are ince  
weekly

The m  
used in  
ing in t  
ber (i.  
ber alon  
observa  
during  
where if

## PLATE II.

Map of outskirts of the northwestern part of Charles City, showing nesting records for 1915-1918, inclusive. The district in the lower right hand corner of the map (south of C. M. & St. R. railway tracks and east of Kellogg Ave.) is so closely built as to make representation of houses undesirable; trees too are plentiful. For this district the nesting records are incomplete; the others indicate field work from two to six times weekly throughout the breeding season.

The numbers indicate the species of birds, and coincide with those used in the general list, though a special list of the species found nesting in the area shown is given below. An asterisk preceeding the number (i. e., \*148) indicates a nest actually observed and plotted: the number alone indicates either: nest seen but exact location not plotted upon observation, or record based on sight of adult male early in morning during breeding season. For general location of the area, see Plate 1, where it is indicated.



## On Premedical Education with Especial Reference to the Viewpoint of Class A Medical Schools.\*

N. M. GRIER, PH. D.

Courses in pre-medical education as at present outlined by most Colleges and Universities cover in a period of two years the minimum requirements for admission to acceptable medical schools, which total 60 semester hours of collegiate work exclusive of military and physical education. In detail these requirements as set forth by the American Medical Association are as follows (†):

### *Required Subjects.*

Chemistry .....	12 hrs.
Physics .....	8 hrs.
Biology .....	8 hrs.
English Composition and Literature .....	6 hrs.

As subjects strongly urged to total the 60 sem. hrs. are indicated,

Modern foreign language .....	6-12 hrs.
Advanced Botany or Advanced Zoology .....	3-6 hrs.
Psychology and Logic .....	3-6 hrs.
Advanced Mathematics, including Higher Algebra and Trigonometry .....	3-6 hrs.
Additional Courses in Chemistry .....	3-6 hrs.

The medical schools at large have usually insisted upon the minimum requirements being taken in a period of two or three years of college work with other subjects the student may elect, with or without proper guidance.

Without indicating the period to be spent in their study, the Association suggests other electives also, presumably as they can be taken in the two year premedical course viz., additional English, Economics, History, Sociology, Political Science, Mathematics, Greek, Latin, Drawing. Un-

\* Paper read before Section F., A. A. A. S. and American Society of Zoologists, Dec. 27, 1923, Cincinnati, Ohio.

† "Choice of a Medical School." 1923. American Medical Association.

less it is felt that the subjects strongly urged or suggested should govern the students choice of electives where he can devote more than two years to preparation for medical school, the remaining work of a four year pre-medical course is largely unsettled except in the case of Chemistry, where three or four years work in that subject may be required by certain medical schools. Occasionally suggestions as to other electives are found, but the fact remains that very few Colleges or Universities have a definitely organized four year pre-medical course although such would be an advantage both for them and for students desiring a prolonged period of instruction, as data presented later will indicate.

In an effort to obtain opinion further defining the scope of pre-medical education already discussed, as well as to secure some basis for the formulation of the same in its best and broadest terms, a questionnaire was sent to the Deans of Class A Medical Schools. These physicians would be expected to be familiar with the defects of present day medical students, and would presumably have some vision of the needs, especially social ones, which future physicians should be able to fill with some regard to conserving the ideals of the profession. So far as premedical education could be considered to meet these needs, they were to indicate on the questionnaire which included a list of the subjects composing the curriculum of a typical College of Arts and Sciences, (as hereafter given in the results presented), and on which the Deans might check all subjects believed to be of broad yet practical interest to the future physician. They were asked to indicate as a maximum where they could, the approximate time such subjects were to be pursued. The subjects of Biology and Chemistry were presented in an expanded form for the stated purpose of learning the division of the subject most favored a given institution in interpreting, (1) the requirements of the A. M. A., (2), the requirements of admission to the school concerned; (3), advisory electives not covered by 1 or 2. In view of the fact that medicine is fundamentally biological and chemical in nature, the Deans were also asked to check the divisions of these latter subjects, which in their opinion, enabled the student to make better progress in medical school, especially those helping him

to perform or assist in research. If the list of the subjects appeared incomplete, they were requested to add such others as they pleased at the end of the questionnaire, and in the case of general titles such as Economics, Psychology, etc., to specify the division of the subject they preferred. Such additions are expressed in *italics*.

The following table represents the choice of the subjects approved by these officials, and since a majority of the Deans, (47 of 68 Class A Medical Schools), responded, may be considered fairly representative of opinion. It thus may be useful for provoking further discussion, if not for Colleges planning a definite four year pre-medical course. All subjects, except those indicated in the *minimum* requirements of the Association, are expressed as electives, except where afterwards in discussion some official emphasizes their positive need.

TABLE 1.

SUBJECT	NOT		Do NOT
	DESIRED	DESIRED	STATE
Accounting -----	1	2	44
Astronomy -----	1	2	44
Bible -----	2	4	41
<b>BIOLOGY</b>			
$\frac{1}{2}$ yr. Zoology and $\frac{1}{2}$ yr. Botany --	31		
<i>High School Biology</i> -----	1		
$\frac{1}{2}$ yr. Zoology alone -----	4		
Invertebrate Zoology -----	27	1	29
Comparative Anatomy -----	35		12
Histology & Microtechnique -----	10	7	30
Cytology -----	1		46
Embryology -----	20	3	24
Heredity and Eugenics -----	20	2	1 24
Botany -----	10	3	34
Bacteriology -----	6	7	1 33
<b>CHEMISTRY.</b>			
General -----	47		
Qualitative -----	34		13
Quantitative -----	28		19
Organic -----	47		
Physical -----	27	2	18
Industrial -----	1		46
Physiological -----	1	11	36



<i>Civics</i> -----	1			46
<i>Composition</i> -----	27			20
<i>Drawing, Free-hand</i> -----	3			44
<i>Economics</i> -----	28	1		18
<i>Education</i> -----	1	3		43
<i>English</i> -----	37			
<i>Ethics</i> -----	11	2		34
<i>French</i> -----	41			6
<i>German</i> -----	40			7
<i>Geology</i> -----	8	3		36
<i>Geography</i> -----	1	3		43
<i>Greek</i> -----	7	4		36
<i>History</i> -----	24	1	1	21
<i>Hygiene</i> -----	8	2		37
<i>Italian</i> -----	5	3		39
<i>Latin</i> -----	13			34
<i>High School Latin</i> -----	8			39
<i>Logic</i> -----	3			44
<i>Mathematics</i> -----	28	1		18
<i>Philosophy</i> -----	10	2		35
<i>Physics</i> -----	47			
<i>Physiology, Human</i> -----	4	2	2	39
<i>Physiology, Comparative</i> -----	1	3		43
<i>Political Science</i> -----	12	1		34
<i>Psychology</i> -----	35			12
<i>Public Speaking</i> -----	1			46
<i>Sociology</i> -----	27			20
<i>Spanish</i> -----	7	3	1	46
<i>Statistics</i> -----	5	4	1	37

## DISCUSSION OF SUBJECTS INDICATED IN TABLE 1.

In the following, it is proposed to amplify those subjects given above concerning which divergent opinion brings out points of interest, or which clearly have some function in pre-medical education. For such reasons, subjects for which a smaller number of preferences were given, such as Astronomy, Accounting etc., are not discussed.

## BIOLOGY AND THE MINIMUM BIOLOGY ENTRANCE REQUIREMENT.

Here the outstanding preference is evidently for the *content* of the old-fashioned Biology course, consisting of one-half Zoology and one-half Botany, the range of time embraced, specified as General Biology being from 4-8 sem. hrs. However,

important institutions react differently and in line with the alternate year of Zoology only as indicated in the A. M. A. requirements. Indiana, George Washington, St. Louis, Emory, Minnesota, Oregon, Mississippi and Cornell unite in preferring 4 sem. hrs. of Invertebrate Zoology and 4 sem hrs. of Vertebrate Zoology. The latter is usually taught from the laboratory standpoint as Comparative Anatomy. Nebraska qualifies this year of strict Zoology by specifying Medical Zoology, Parasitology and Vertebrate Zoology as the subject to be taken. Western Reserve accepts either Biology or the pure Zoology. Johns Hopkins, Stanford and Harvard believe that the minimum entrance requirement should consist of Zoology, Comparative Anatomy and Embryology; California, General Zoology and Embryology. Yale makes up the minimum requirement somewhat similarly. Loyola indicates a course in Comparative Anatomy and the Histology of elementary tissues, following and entrance requirement of High School Biology. Creighton desires 1 hr. of Invertebrate Zoology, 3 hrs. of Vertebrate, 1 of Heredity and Eugenics, 2 of Botany. Pennsylvania gives 3 hrs. of General Biology, 3 of Invertebrate Zoology, 3 of Comparative Anatomy.

### INVERTEBRATE ZOOLOGY.

The range of instruction in this subject regardless of the combination is from 3 mos. to 1 year in time, with most preferring 4 sem. hours. The following institutions indicate work in it beyond General Biology; which it usually follows in the curriculum; Stanford Yale, Tufts, N. Dakota, Jefferson, Pennsylvania, Pittsburgh, Texas, W. Virginia, Chicago.

### COMPARATIVE ANATOMY.

The institutions just named also indicate this subject to follow Invertebrate Zoology. The range of the instruction recommended varies from 3 mos. to a year, 4 sem. hrs. and  $\frac{1}{2}$  year being most common. Loyola, Boston, Western Reserve, Dartmouth, Cincinnati, Womens Medical and Wisconsin evidently desire this subject to follow General Biology.

More  
which  
the min  
as to th  
in the c  
it woul  
based u  
dent p  
of thes  
the sub  
taining  
known  
made  
effort  
will ne  
Associ  
credite

The  
to 1 y  
hrs. b  
binati  
anatom  
nesota  
as His  
kota,  
it. T  
lower  
velope  
credit  
would  
will b  
but th  
Still  
this s  
tion.

## HISTOLOGY AND MICROTECHNIQUE.

More institutions definitely desire this course than those which do not. Two semester hrs. is the maximum time;  $\frac{1}{2}$  hr. the minimum. As a part of the questionnaire, inquiry was made as to the conditions under which this subject would be credited in the curriculum of the Medical Schools. Eight indicated that it would be given credit when the work was of the same grade, based upon human or mammalian material, and when the student passed an examination in the subject. Even then, most of these thought that the student should do advanced work in the subject, but that may be due in part to the difficulty of obtaining a satisfactory schedule for the student. Cases are known where students thus qualified for entrance, have been made temporary laboratory assistants in the subject in an effort at equable adjustment. Five definitely state that credit will not be allowed under any condition, reminding that the Association of American Medical Colleges does not allow time credited for work done in a College of Arts and Sciences.

## EMBRYOLOGY.

The time recommended for this course ranges from 3 mos. to 1 yr., free or in combination with other courses, 2-4 sem. hrs. being most popular. Western Reserve suggests a combination course of this subject with elementary mammalian anatomy. Yale, Stanford, California, Illinois, Tufts, Minnesota, St. Louis indicate it to be taken at some time, as well as Histology. An equal number—Tulane, Dartmouth, N. Dakota, Cincinnati, Oregon, Texas and Wisconsin do not desire it. Twice as many prefer it as do Histology. Embryology of lower forms than mammals is suggested by others. It developed that five of the Medical Schools would accept it for credit under conditions described for credit in Histology; three would not under any circumstances. One states that credit will be given for elementary Embryology in Medical School, but the student must select further work in the human study. Still another remarks that the student will be excused from this subject in Medical School and gives no further qualification. Four indicate it definitely as an elective, others state

it as being desirable. The relation of these last two subjects to future medical education will be brought out later.

### HEREDITY AND EUGENICS.

The large number indicating this subject must be a source of gratification to Biologists at large in times when physicians of an older generation reiterate, against the burden of scientific evidence, their belief in prenatal influences, the transmission of acquired characters, etc. A physician with some training in this subject will be in a position to exert a greater socializing influence in his community.

### BOTANY AND BACTERIOLOGY.

Botany where desired as an elective is indicated from  $\frac{1}{2}$  sem. hr. to 4 sem. hrs. as a minimum time. More do not desire Bacteriology; those who wish it, suggest  $\frac{1}{2}$  yr. or 2 sem. hrs. work in it. Bacteriology is a subject which under suitable qualification might be transferred from Medical Schools to Colleges of Arts and Sciences.

### REMARKS ON BIOLOGY AS A PRE-MEDICAL SUBJECT.

There is some disagreement as to the part which Biology should generally play in premedical education. One Dean, a member of the A. M. A. committee which formulated the minimum entrance requirements, states that while Biology is highly desirable it is not essential, since the medical course itself will give the biological viewpoint. His contention is chiefly based on the supposed fact that lack of Biology may prevent certain students who are late in commencing their medical studies, from qualifying for entrance, since such men usually have the minimum requirements in other subjects. However, the evidence is that collegiate biological courses are increasing in numbers, and the content of the letter discussing the preceding question indicates that Biology should be the major in a four year premedical course, an opinion which three other Deans definitely state, and many indicate from their choice of the list of electives. One writes "I would make the work in Biology the major study in the premedical course using Biology in a wide sense, perhaps having parallel courses

in sub-divisions, in order to get more than two years work in Biology in the two years required premedical work." The Dean of another school comments upon the almost complete lack of correlation of the clinical and laboratory subjects, and states that placing certain medical subjects in the college pre-medical work may help correlate them better, adding that the knowledge acquired during pre-clinical years should be better applied than at present. He complains that at present much of the work is memorized until examinations are passed, and can not later be applied.

#### MINIMUM GENERAL CHEMISTRY ENTRANCE REQUIREMENT.

As returned in the questionnaire, this ranges from 4-10 hrs. credit, the majority favoring 8 hrs. Seven state it may include qualitative Analysis. Howard and Cornell indicate that it must. Yale gives somewhat less General Chemistry, making up the requirement in Qualitative and Quantitative Chemistry.

#### MINIMUM ORGANIC CHEMISTRY ENTRANCE REQUIREMENT.

Most of the schools desire a 4 hr. course, although 6-8 hrs. is the average, the time indicated being from  $\frac{1}{2}$ -1 year. Some would like to see more Organic Chemistry required for entrance, the necessary Qualitative Analysis being in General Chemistry.

#### QUALITATIVE ANALYSIS.

Two believe that instruction in this subject should be combined with General Chemistry, the time to be consumed varying from 2-5 sem. hrs. and from  $\frac{1}{4}$  to 1 year. This subject is definitely required by Columbia, Cornell and Johns Hopkins.

#### QUANTITATIVE ANALYSIS.

This subject may consume from 2-5 sem. hrs. and from  $\frac{1}{2}$  to 1 yr. in time. Most indicate two hrs. Required by Johns Hopkins and Cornell; Boston and Nebraska indicate the volumetric analysis as being preferable; Creighton thinks the subject should be included in other courses.

## PHYSICAL CHEMISTRY.

The scope desired ranges from 1 unit and  $\frac{1}{2}$  yrs. work to 4 sem. hrs. and 1 year in the time thought adequate. The majority favor a 2-4 hr. course. St. Louis and Minnesota prefer it given in Medical School. Required by Johns Hopkins for entrance. Some who do not indicate it as an elective feel that instead of separate instruction in it, that its atmosphere should pervade the instruction in the minimum entrance requirement in Chemistry.

## PHYSIOLOGICAL CHEMISTRY.

Only one medical school desires this to be part of the pre-medical instruction. Eleven think it should be confined to the purely medical curriculum.

## REMARKS ON CHEMISTRY AS A PREMEDICAL SUBJECT.

One Dean writes "the greatest problem of our entrance requirements is in connection with Chemistry. We find that our students are unable to handle elementary chemical problems, apply simple arithmetic and simple algebra to theoretical considerations. The majority have difficulty with 8th grade arithmetic and college algebra. This is a stumbling block when they attempt to apply Chemistry to Physiology." On the other hand, another Dean states that while Chemistry is necessary, it is now emphasized too much for future practitioners in medicine, his belief being that except for some elementary courses it belongs on the specialist side of medicine. Another remarks that it is difficult to see what the quantitative analysis of iron, sulfates etc.—a common part of the Quantitative course—can best provide by way of preparation for the study of medicine.

## ECONOMICS.

This subject as an elective has an indicated range from  $\frac{1}{2}$  yr. to 1 yr., embracing from 2-6 hrs. work. Its designation may be significantly interpreted as a desire to emphasize necessary cultural elements in premedical education.



## ENGLISH LITERATURE AND COMPOSITION.

These two subjects are best discussed together. For the first, 2-12 sem. hrs. are designated the average being 8. Some indicate more than two years study of Literature, and one states it should include composition. More indicate it than Composition, which varies from 2-8 sem. hrs. with 4-6 hrs. as the average, and embracing  $\frac{1}{2}$  to 1 year of time. Some schools do not state their preference, but all indicate one or the other. One Dean in discussing the competency in English of the average medical student, states that if the latter is called upon to read aloud a selection of well written English, technical or otherwise, he finds the average word of three or more syllables an insurmountable stumbling block. He further quotes an educator of national reputation as stating that a course in Physics to which the average student would have to devote a year of hard work, could be mastered in all its essentials in six weeks by another student of equal ability whose training in English and experience left nothing to be desired. Instruction in English literature seems to be the logical way of developing a taste for spontaneous reading on the part of the student, yet this Dean notes that few students read beyond their text book assignments. Another Dean indicates doubt concerning courses in English beyond the minimum entrance requirement, making the pointed remark that every course should be a course in English. Still another goes so far as to state that 90% of the men who have trouble with the medical course, do so because they do not know how to read or write intelligently or critically. Two and three hour courses in Literature are advocated also. There might well be a special course in this subject for professional students, instead of the general course all who elect it now take.

## MODERN LANGUAGES AND THE MINIMUM MODERN LANGUAGE REQUIREMENT.

Most of the Deans desire two years study of the language elected, 6-8 sem. hrs. being the more common credit desired. Two suggest that the language be preceded by a High School course. The minimum for French is 6 sem. hrs., the maximum being a reading knowledge. For German 4-20 sem. hrs.



or a reading knowledge is wanted. Seven desire both, but German is preferred as first choice in 3 cases, French in but one. The others do not indicate a preference. One Dean cautions against more than the allotted language requirement, as certain State Boards of Medical registration object to an excess of language in pre-medical requirements. Another objects to the emphasis on foreign languages remarking that 95% of the medical graduates have no other use for it beyond satisfying the entrance requirement. It is additionally pointed out that all articles of merit in foreign languages are translated and abstracted into English, and are as quickly available to the student as they could receive the original journal of publication. This latter statement should answer the contention of other Deans that the preliminary work in modern languages gives the student access to scientific literature; not only that, the translations themselves are rendered into better English than the student himself could compose. In commenting upon this situation, still another remarks that if the present requirements prevail, the test of a foreign language should be the competency of its use, and not the time spent in failing to master it as has been the case in the past. A fourth writes that if the premedical course was three years in length he would recommend a reading knowledge of the elected language be required. Others say that if the languages have no other virtues, they are part of a liberal education, but one remarks that until we get a good method of acquisition of languages, the time spent in dabling in them, can be spent to better advantage in Biological sciences.

#### GEOLOGY.

This subject seems worthy of mention as one of the most cultural and broadening of subjects. Three sem. hrs. is the commonest period of study indicated in the returns.

#### GREEK.

Those who wish Greek indicate a 3 sem. hrs. course, but four definitely do not desire it. One asks that the course be one in the etymology of words, inasmuch as scientific terms are more frequently Greek than Latin.

Most  
2 year  
One De  
genera  
History

One  
thinks  
person  
where  
be tra

Ital  
guage  
depen  
practi

Of  
High  
be tra

Ma  
one s  
doubt  
Trigo  
think  
it be  
view  
Dean  
when  
stan

A  
med  
belie  
of st

## HISTORY.

Most indicate 1 year of History, of from 2-6 hrs. Two desire 2 years. One prefers Ancient History, another American. One Dean speaks of the desirability of some acquaintance with general historical ideas, and favors a general survey course in History.

## HYGIENE.

One year is the general indication for this subject. One thinks a general course should be given; another emphasizes personal disease. Is there any good reason why this subject where continued as such in the medical curriculum should not be transferred back to the College.

## ITALIAN.

Italian is given principally as a substitute for other languages, or as a one year elective. Its utility would principally depend upon the needs a student would anticipate meeting in practice.

## LATIN.

Of the twenty-one indicating Latin, 13 prefer it taken in High School. If not taken in High School, it is mostly indifferently transferred back to the College?

## MATHEMATICS.

Mathematics varies from a highly desirable elective where one states that a student should have as much as possible, to a doubtful subject. Most think it should be pursued through Trigonometry and Algebra, or about one year's work. Others think half a year is sufficient. One definitely does not desire it beyond the entrance requirement. In this connection, review the remarks on Chemistry as a pre-medical subject. One Dean believes that two years of mathematics is very wise, when its values are considered from a number of different standpoints.

## PHILOSOPHY.

A large number are in favor of Philosophy in the pre-medical curriculum than those who are opposed to it. One believes 2 years of study is excellent, but the average period of study is 3-6 hrs. through one year.

## PHYSICS.

Three desire 10 semester hrs. in Physics, most indicate 8 hrs. At Yale it is optional with Physical Chemistry. There is considerable dissatisfaction with the teaching of Physics to pre-medical students. Detroit advocates a special course for them, as certain English Colleges actually do present. It is stated that to the premedical student the average problems in Dynamics, etc., are comparatively valueless whereas the principles of Hydrostatics, Hydraulics, Pressure of Gases, conductivity, etc., are more important. It is remarked with truth that to the Physics teacher the average premedical student is a nuisance, if any special effort is made to provide for his needs. Another Dean states his belief that the study of Physics is over emphasized for the practitioner in medicine, as it belongs more to the specialist side. In this connection the remarks made in the discussion of English as a premedical requirement are of interest.

## POLITICAL SCIENCE.

Those who wish this subject in the premedical course indicate 1-4 semester hrs. and one year as the time to be devoted. It undoubtedly is a liberalizing element.

## PSYCHOLOGY.

Psychology is classified by nearly all as a very desirable elective. The time to be consumed varies from 2 sem. hrs. to 2 years work. Most prefer a 3 hr. course. Two believe that it should be substituted in part at least for the time devoted to a foreign language. One thinks that the instruction should be in the medical curriculum, but as we shall later see there is no place for it. Another reminds of its necessity as a basis for the study of insanity.

## SOCIOLOGY.

The remarks made for Psychology will apply to Sociology also. One Dean regards it as being more important than economics for the study of medicine.

STAT  
varies  
some  
classifi  
tionna  
urged  
School  
questi  
small

The  
named  
"the s  
We be  
good  
tain t  
manit  
argue  
of De  
of m  
adju  
ened,  
shift  
as is  
shoul  
befor  
"if l  
forg  
liber  
thos  
scien

It  
som  
men  
conc  
they  
conc  
ever

## MISCELLANEOUS.

STATISTICS is not universally desired, but where indicated varies from 2 sem. hrs. to one year. SPANISH is regarded by some as a desirable elective, while FREEHAND DRAWING is classified as being very useful. Three added LOGIC to the questionnaire. This subject was suggested rather than a strongly urged elective in the 1922 edition of *"Choice of a Medical School,"* which was in the hands of the Deans at the time the questionnaire reached them, this possibly accounting for the small number indicating it.

The ideals guiding the choice of the subjects previously named are summed up in a letter from one Medical School—"the student should get a good foundation in fundamentals. We believe in a broad and cultural college course, as well as a good preliminary scientific training," Some, however, maintain that the premedical course should be as broad in the humanities as in the sciences, but feel that economic conditions argue against an increase in the requirements for the degree of Doctor of Medicine. We shall later see that the expansion of medical science will imperatively demand appropriate readjustment, and if the medical curriculum is not to be lengthened, some of the present day medical school work must be shifted back to the Colleges of Arts and Sciences. So far then as is possible, the premedical work of the future physician should transform him into an educated man, (actually stated), before he takes up medicine, but in the words of one Dean, "if liberalizing courses are advocated by some, we must not forget that a distinguished educator said that every study is liberal if pursued in a liberal spirit," a point of interest to those who are opposed to greater preparation in Biological science.

It is now clear that there is dissatisfaction on the part of some Class A Medical Schools with the prevailing requirements and indicated content of pre-medical education. Such concerns the actual subjects studied and the range of utility they should be to the student. Schools which are conservative concerning the indicated requirements, definitely state, however, that the Colleges would better prepare students for med-

icine if they introduced higher standards of admission and accomplishment, when the students under existing requirements would be well enough fitted for progress in Medical School. Three Deans write that they do not believe 30 sem. hrs. work is sufficient for a student to complete in a year, consequently beginning medical students do not react suitably to the far heavier program in Medical School, because they are not used to it. It is believed that the better Colleges and Universities know that their students are not overburdened with work, but all seem to have difficulty in evolving suitable plans to tighten up their standards as a step toward giving their students more to do.

It is to be regretted that all the Deans did not reply to the questionnaire, even after a second request was made for it, and that others did not furnish the information in such detail as would make these results more complete. To all who contribute in connection, including Mr. H. J. Bush, a former assistant of mine whose aid was especially valuable, my hearty thanks are due.

Reflection leads to the conclusion that the minimum entrance requirements to acceptable Medical Schools as already stated, have been established with regard to the following reasons:

1. To provide the minimum fundamental background for the study of medicine, which a student should also master as a test of his ability to commence his strictly professional studies.
2. To formulate the requirements for such a background with regard to the economic circumstances of the average student and those surrounding his future practice of medicine. Some for example, consider it desirable to enter practice as soon as possible, but at a period considered early by others.
3. It is possible that with regard to one subject and its divisions, e. g. Biology, that the entrance requirements are at present adapted to the caliber of instruction that most Colleges are felt able to give, for while the medical curriculum is badly crowded, certain Biological subjects such as Histology, Bacteriology etc., which are given in many Colleges, are re-

tained  
given  
taught  
althoug  
with th  
the scie  
College  
is large  
guarde  
acting.

If in  
urged a  
ical As  
ions of  
medica  
quired  
meet t  
brough

It is  
cerned  
mum  
two ye  
tain so  
time e  
der in  
rural  
to enc  
period  
pect f  
hand  
esteem  
consec  
tion a  
ceptal  
remen  
shown  
school  
accru

tained in the medical curriculum, where it is true they are given more thoroughly. At the same time these are often taught by men who have taken their Doctor's degree in Biology, although some have completed a medical course subsequently with the idea of better understanding the medical aspects of the science. In short the difference between the Biology of the Colleges and that of the first two years of the Medical Schools is largely a question of the amount of work covered as safeguarded by standards, points to which Colleges are now reacting.

If in connection with the preceding we consider the strongly urged and suggested electives laid down by the American Medical Association, the returns of the questionnaire and the opinions of the authorities as to the best and widest scope of premedical education, we are led to believe that a four year, required premedical course is one which will most satisfactorily meet the situation especially in view of other points to be brought out.

It is true that a required four year premedical course is concerned only with the first and third reasons given for the minimum entrance requirements stated above, for so long as but two years premedical work is required as a minimum by certain schools, many students will not take a longer period. The time element at present seems to be an important one to consider in educating physicians, as in certain regions, especially rural ones there is a dearth of them. It will always be difficult to encourage men to enter the profession, when in a similar period of preparation for other occupations, they have prospect for ultimately greater financial rewards. On the other hand the medical profession desires to conserve the high esteem it has always held in the human mind, and as a possible consequence, many medical schools are now requiring in addition a collegiate degree for entrance, as insuring the least acceptable background. This does not seem too much when one remembers that ability to complete a College course has been shown not to positively insure a student's success in medical school. It is fair then to assume that some advantage could accrue to the student if during the remaining years of his pre-



medical work, the subjects of his course would be definitely such as to combine additional cultural subjects as well as to give him the lay of the land ahead by means of instruction in advanced Biological subjects. Thorough instruction in the latter if survived by the student, would probably go a long way toward making an easier transition to medical school, for medicine is essentially applied Biology, and under existing conditions it would tend to lighten the burden of the first two years perhaps his hardest, but at the same time, closets to his pre-medical work. Additionally it would tend to give him more time for personal growth, such as assisting in research, or for that matter any pursuit enabling him to find the field of medicine for which he is best fitted. This fits in with the old fashioned but most satisfactory idea, that a physician should be a leader in his community.

As an example of the present day attitude of medical schools in this matter, it will be remembered that certain medical schools do not wish the student to have had previous instruction in collegiate Histology or Embryology, claiming at least that such robs their teaching of its novelty. However, others state that they have scarcely time to give the important things in these subjects under existing conditions of instruction, while some recognize the usefulness of cultural preparation of Biological subjects in studies such as Human Anatomy, which is at best largely a matter of mechanical memory for the student—hence their suggestion that the student take Comparative Anatomy as an elective, a subject which has both practical and cultural values for Anatomy and Embryology of the Medical School. Still other institutions recognized the principles involved in the last statement, and specify that if Embryology and Histology be taken, the former be non-mammalian while the latter should be a general animal Histology, neglecting the human aspect.

If we have been led to believe that premedical education should at least cover a period of 3-4 years; that the present day medical curriculum is overcrowded with prospects for greater overcrowding still as medical science explores new fields; if we desire to shorten with a desirable consistence of cultural

and pr  
dent be  
able th  
require  
either  
by som  
to the  
what  
preme  
the se  
School  
the pr  
in thi  
while  
scienc  
tural  
ician

Dart  
H



and practical aims the period of study of the premedical student before he commences to earn his livelihood, it seems probable that the Medical Schools, if only for the reason they will require further time for their purely medical subjects, must either increase their period of instruction, (already lengthened by some to include a fifth interne year), or return some of it to the pure science of the Colleges and Universities. Somewhat of a tendency toward this is seen in the 7 year combined premedical and medical courses of certain universities where the senior year for College credit is taken in the Medical School. Although the time factor of the student was probably the primal reason for this combination, disadvantages appear in this plan when it is regarded from the cultural side, for while students may profitably take their advanced Biological science in this way, yet a good deal of time is lost from the cultural subjects which might eventually enable the future physician to find his better field of service.

*Dartmouth College,  
Hanover, N. H.*

## BOOK REVIEWS

In this section are reviews of new, or particularly important and interesting books in the fields of natural science. Books dealing with botany or kindred subjects should be sent to the Editor, the University of Notre Dame. *All other books for review* should be sent to Carroll Lane Fenton, at the Walker Museum, the University of Chicago, Ill. Publishers are requested to furnish prices with books.

**THE HUMANIZING OF KNOWLEDGE.** By James Harvey Robinson. George H. Doran Co., \$1.50. (paper bound, \$1.00.)

There are plenty of complaints, on the part of scientists even, that most knowledge is so bound up in technicality as to be useless to nine tenths of educated humanity. So far as I am aware, however, Professor Robinson is the first specialist to take these complaints seriously to heart and try to do something for the general remedying of the matter. This book contains his plan of action and his basis for it; both of them look extremely solid.

In the first essay Dr. Robinson admits man's general indifference to knowledge, and shows that the seeker after truth is not only an exceptional being, but often a positive freak. In the second, he shows that for science to be of any value at all, it must be dehumanized to some extent at least. By "dehumanized" he does not mean 'dry,' but rather 'unemotional' or 'unprejudiced.' The dryness is an incidental and unnecessary feature. Other essays cover such subjects as the importance of scientific discoveries, the present organized opposition to facts of all sorts that do not fit in with inherited ideas, and finally, a proposal for writing of a sort that will combine both accuracy and interest. Dr. Robinson is not interested in "popular science" of the sort that fills pages of the Hearst dailies; what he wants is the real thing, at once readable and reliable. The essay on "The Democratization of Science" outlines the subjects and attributes of a whole series of books that would fill his requirements. The publishers say that they have started to work on the plan; a most promising assurance, but I confess myself alarmed by a "group of the ablest scientists in the United States and abroad." Dr. Robinson may convert publishers to popularize science, but can he convert scientists to the use of plain English? I wonder.

—C. L. F.

**THE FERN LOVER'S COMPANION.** By George Henry Tilton. Little, Brown & Co. \$3.00.

Every lover of nature feels the fascination of ferns even though he may know little of their names and habits. He finds them in little valleys, on rugged cliffs, bordering pretty streams, and carpeting old sand dunes. If he knows them already, he is incited to new interest and study;

if he is  
close ac  
With

First is  
ture an  
quite e  
used it  
I took  
cusses  
And th  
as I ca  
the init

I ca  
which  
they a  
supple  
a diagn  
percen  
mark  
tractiv  
and w

THE M  
m

EVERY

DWEL

m

Her

and e

specia

icals,

ried o

pictur

ing h

exper

ally m

Mr

less o

the o

as w

and

cusse

to hi

and

if he is not, he wishes some book that will help him to a prompt and close acquaintance. Such a volume is this by Mr. Tilton.

With the purpose of the book stated, we may proceed to its contents. First is an introduction, giving the general facts of reproduction, structure and habit. Then a key to the genera which, though brief seems quite adequate. At least, I, who am the merest tyro in botany, have used it and found my determinations approved by the expert to whom I took them. In a few cases I went on to use the third part, which discusses the numerous species of ferns, and there too I was successful. And this indeed is a recommendation. If one who knows so little of ferns as I can achieve accuracy by the use of Mr. Tilden's book, what might the initiate do?

I cannot pass the volume by without comment on the illustrations, which are numerous and excellent. It is no exaggeration to say that they account for half the book's usefulness, and will form a valuable supplement to even far more exhaustive treatises. Pictures do not make a diagnosis, but they do make that diagnosis usable to about ninety-nine percent of the people. The ones in this book come close to the high-mark of excellence. In fine, "The Fern Lover's Companion" is an attractive thing, different from all other books on ferns that I have seen, and wholly fine.

—C. L. F.

THE BOY'S OWN BOOK OF SCIENCE. By Floyd L. Darrow. The Macmillan Co.

EVERYDAY MYSTERIES. By Charles Greedy Abbot. The Macmillan Co.

DWELLERS OF THE SEA AND SHORE. By William Crowder. The Macmillan Co.

Here are three books, each of them excellent, each of them interesting, and each of them thoroughly reliable. In the first, Mr. Darrow appeals specially to the boy or girl who likes to work with test-tubes and chemicals, giving over a hundred significant experiments which can be carried on either at home or in any high-school laboratory. There are many pictures of youngsters actually at work, and plenty of diagrams showing how to manipulate the necessary apparatus. The interest of several experiments is heightened by short sketches of the scientists who originally made them—an excellent means of making science real.

Mr. Abbot, writing for younger people than Mr. Crowder, makes a less direct appeal to these with well-developed hobbies. His subjects are the ordinary things of a household—doorbells, furnaces, and sweepers, as well as the more striking of natural objects, such as the sun, the sea, and garden plants. On the whole he makes the things which he discusses very attractive; so much so that his book should appeal not only to his special audience of children, but to high school students, parents, and even teachers as well. The grade teacher, equipped with the knowl-

edge that Mr. Abbot makes easily accessible, could answer readily many of the questions which her pupils are bound to ask, and could answer them convincingly. And for that matter, there are many college graduates (not excepting the present reviewer) who can learn much from "Everyday Mysteries."

But the best book of the three, by all odds, is Mr. Crowder's "Dwellers of the Sea and Shore." Ostensibly it is designed for youngsters aged 12 to 15; as a matter of fact, it is suited to the needs of anyone from 12 onward, providing he has a liking for living animals. It lacks both the technical words which often make a book suitable for study but not for reading; at the same time it is burdened with none of the childish Burgess-esque baby-talk which makes many a nature book fit only for the rubbish heap.

To review the book fully would be to write a summary of marine natural history. Instead, I shall outline its organization, and mention a few specially attractive chapters, in the hope of both indicating the general nature of the contents and showing the unusual features of the book. Part one is entitled "The Seashore," and includes such chapters as "The Seashore Naturalist," "Social Life in the Salt-water World," "Marine Groves and Gardens," and "Feathers and Feelers." In them appear such old friends as the starfish, sea urchin and hermit crab, as well as the less known moon snail, comb jellies, and salt-water plants. Part two, dealing with the life of tide pools, includes more unusual animals—squids, worms of several types, and unusual sorts of crabs. The most interesting single chapter is entitled "A Living Fossil," and recounts the life habits of the horse-shoe crab, relative of the ancient trilobites. Oddly enough, though specimens of the creature are to be seen in museum and curio store, this is the one complete and readable account of his ways of living that is to be found in an accessible English book.

The third and last section, entitled "The Open Sea," describes those creatures which the technical zoologist labels "pelagic." From protozoa and corals to fishes and whales the account runs, combining interest with accuracy in a manner that leaves little to be desired. The last chapters, on "Life in the Ancient Seas" and "Our Salt-water World," give summaries of our knowledge of fossil marine animals and our knowledge of the sea itself. Necessarily these summaries are brief; each of the subjects would justify a book the size of the one which Mr. Crowder has written. But they are not hasty, and therein lies their excellence. If one wishes to go farther into the fields they afford an excellent base for reading; if he wishes to stop where he is, they give him a well proportioned general view. And they are not dry.

—C. L. F.

any  
wer  
adu-  
rom

lers  
1 12  
12  
the  
for  
tur-  
the

rine  
tion  
the  
the  
ters  
ld,"  
nem  
as  
nts.  
ani-  
The  
re-  
ilo-  
een  
ac-  
lish

ose  
and  
ac-  
ers,  
um-  
dge  
the  
has  
one  
ad-  
ned